

Clinical Reviews

Burnout, Stress, and Moral Injury Among Emergency Medical Services Clinicians: A Systematic Review

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Abstract—Background: As frontline health care workers, Emergency Medical Service (EMS) clinicians are subject to stressful conditions. These conditions contribute to burnout, stress, and moral injury. **Objective:** The objectives of this systematic review were to 1) evaluate the incidence, prevalence, and severity of adverse occupationally related mental health conditions, including burnout, stress, and moral injury among EMS clinicians; and 2) to identify any modifying factors associated with those conditions. **Methods:** We searched MEDLINE, Embase®, Cochrane Register of Clinical Trials, PsycINFO®, and Cumulative Index to the Nursing and Allied Health Literature from January 1, 2001 through June 30, 2024. We also searched websites, the ClinicalTrials.gov registry, and journals not indexed in Medline. To increase applicability to the U.S. decision-making context, we restricted to studies of EMS clinicians in high-income countries. We used standard methods to assess the risk of bias and evaluate the strength of evidence. **Results:** We included 92 studies (88 cross-sectional studies and 4 cohort studies). During routine practice, the mean levels of organizational job stress were mild to moderate, burnout and general stress were mild to severe, and secondary traumatic stress was mild (moderate strength of evidence for

each). There was considerable heterogeneity in prevalence and severity by country, setting, population, context, and outcome measurement instruments and scoring methodology or threshold. No study reported on incidence. Some modifying factors (e.g., more trauma exposure, more hours per week, more burnout, higher call volumes) may be associated with poor outcomes. **Conclusions:** Despite considerable variation, the stress issues in the EMS workforce are substantial enough to merit greater attention by health systems. Addressing these challenges will require evidence-based comprehensive strategies that consider the modifying factors associated with poor outcomes. © 2026 Elsevier Inc. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

Keywords—EMS; burnout; stress; moral injury; systematic review

Introduction

The Emergency Medical Services (EMS) workforce is routinely exposed to stressful events, shift work, and oc-

cupational environmental stressors. As trained health care professionals who assist in out-of-hospital emergencies, EMS clinicians provide around-the-clock, life-saving pre-hospital care to individuals with medical or traumatic emergencies.

The EMS workforce is impacted by burnout and moral injury. A 2019 survey of 1547 EMS clinicians from the world's largest cities found that 60% agreed with the statement "I feel burned out in my EMS work" and 36% agreed with the statement "I don't want to do EMS work anymore" (1). During the COVID-19 pandemic, EMS clinicians experienced high burdens of anxiety, depression, and posttraumatic stress disorder (2).

The *International Classifications of Diseases*, 11th revision, classified burnout as "a syndrome resulting from chronic workplace stress that has not been successfully managed" (3). Burnout is characterized by feelings of lethargy and emotional exhaustion on the job, negativism toward one's occupation, and reduced professional output (3). EMS clinicians are exposed to various traumatic or stressful circumstances in which they may "perpetrate, fail to prevent, or witness events that contradict deeply held moral beliefs and expectations" (4). According to the World Health Organization, occupational stress is "the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope" (5). Twenty percent of workers report some form of psychological injury associated with the workplace (6). We categorized stress into the following three categories: general stress, peritraumatic/secondary stress, and posttraumatic distress. The existing literature supports these three as phenomenologically distinct constructs (7,8). Moral injury is the syndrome that arises as a consequence of "perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations" (4). Moral injury has been found to contribute to burnout and a reduced ability to provide care (9).

We conducted a systematic review that addressed the following research questions: What are the incidence, prevalence, and severity of burnout, stress, and moral injury among EMS clinicians? Are the incidence, prevalence, and severity modified by agency composition, characteristics of EMS clinicians, and availability of physical and mental health resources?

Materials and Methods

This review is part of a larger systematic review commissioned by the U.S. Agency for Healthcare Research and Quality (AHRQ) to examine the evidence on mental health and occupational stress issues in the EMS and

911 (telecommunicator) workforces. With input from a technical expert panel and representatives from AHRQ, the U.S. National Highway Traffic Safety Administration and the National 911 Program, we prospectively registered a protocol with the PROSPERO international systematic review registry (CRD42023465325). We followed the AHRQ Methods Guide for Effectiveness and Comparative Effectiveness Reviews and report this systematic review in accordance with the Preferred Items for Reporting in Systematic Reviews and Meta-Analyses reporting guidelines (10–12).

Eligibility Criteria

We included cross-sectional and longitudinal studies conducted in the United States or other high-income countries (defined according to the World Bank criteria (13)) that evaluated at least 100 EMS clinicians (Table 1). A predetermined sample size cutoff was the most rigorous way to restrict the size of the evidence base in accordance with project timelines. We excluded studies of firefighters unless $\geq 80\%$ of participants conducted EMS work.

Data Sources and Searches

We searched MEDLINE (using PubMed), Embase®, the Cochrane Register of Clinical Trials, PsycINFO®, and the Cumulative Index to the Nursing and Allied Health Literature (Appendix A). We restricted our search to English-language studies published in the year 2001 onward to capture evidence after the September 11, 2001, attacks in the United States because we determined *a priori* that older studies likely have little relevance to modern EMS practices. We also searched the websites of six federal agencies and national organizations related to telecommunicators and EMS clinicians as well as five journals not indexed in MEDLINE. We searched ClinicalTrials.gov for ongoing studies, unpublished study protocols, and unpublished study results, and hand-searched the reference lists of relevant systematic reviews.

Study Selection

After two rounds of pilot screening involving the entire team, two trained screeners from the author team independently screened each title and abstract using DistillerSR® software (Evidence Partners). Potentially eligible abstracts underwent full-text screening using the same criteria. We resolved conflicts during abstract and full-text screening through discussion or involvement of a third screener.

Table 1. Eligibility Criteria.

Element	Key Question 1
Population	<ul style="list-style-type: none"> • EMS workforce: Civilian field responders (either ground or air personnel, based either in the field, e.g., street corners or nonfield, e.g., station, hospital) not in training at the time of the study <ul style="list-style-type: none"> ○ Paramedics, including firefighter paramedics, flight medics, critical care paramedics ○ EMTs, including AEMTs and firefighter EMTs, flight EMTs ○ EMRs ○ Field response physicians ○ Field response nurses ○ Field response advance practice providers ○ EMS medical directors ○ Firefighters, rescue workers, emergency workers, or first responders, as long as they do EMS work. For this criterion, we included studies that enrolled $\geq 80\%$ participants who qualified. For studies in which $< 80\%$ participants qualified, we only included the study if data were reported separately for the participants who qualified, and we extracted those data specifically.
Interventions	Not applicable
Comparators	Not applicable
Outcomes	<ul style="list-style-type: none"> • Incidence of behavioral health issue or stress • Prevalence of behavioral health issue or stress • Severity of behavioral health issue or stress
Study designs	<ul style="list-style-type: none"> • Cross-sectional studies • Cohort studies • ≥ 100 participants
Modifying factors	<ul style="list-style-type: none"> • Individual-level factors <ul style="list-style-type: none"> ○ Demographic characteristics (e.g., age, sex) ○ Workforce type (EMS clinicians vs. telecommunicators) ○ Education/training, proficiency, experience/career stage, trauma exposure ○ People with self-identified burnout, stress, moral injury, or who may be at increased risk for mental or behavioral health issues • Agency factors <ul style="list-style-type: none"> ○ Agency size ○ Agency location (urban vs. suburban vs. rural) ○ Shift characteristics (e.g., duration, frequency, timing, predictability) ○ Workflow (e.g., role conflict, role ambiguity, warnings before psychological exposures) ○ Regulations ○ Compensation model ○ Availability of mental health resources • Intervention factors <ul style="list-style-type: none"> ○ Intervention level (i.e., individual, organizational, system-wide [local/state/national], or combined) ○ Intervention target (i.e., CISM, subacute coping/stress management, or long-term stress management)

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Table 1. (continued)

Element	Key Question 1
Timing	• 2001 to present
Setting	<ul style="list-style-type: none"> • Prehospital • In-hospital/emergency department • Any high-income country (according to World Bank Criteria (13))

AEMT = advanced emergency medical technician; CISM = critical incident stress management; EMR = emergency medical responder; EMS = Emergency Medical Services; EMT = emergency medical technician.

Data Extraction and Risk of Bias Assessment

We extracted data regarding study characteristics, study participants, exposures and comparator, relevant outcomes, and results. We evaluated risk of bias in each cross-sectional study using items from the tool developed by Hoy and colleagues (14). For longitudinal studies, we used items from the Joanna Briggs Institute Checklist for Cohort Studies (15) and the Newcastle Ottawa Scale for Cohort Studies (16). We extracted data and risk of bias information into the Systematic Review Data Repository Plus platform <https://srdplus.ahrq.gov>. One trained data extractor from the author team extracted data and assessed the risk of bias in each included study; these were verified by a second trained data extractor from the author team. Discrepancies were resolved through discussion.

Data Synthesis and Analysis

We summarized the evidence narratively and in tables.

Grading the Strength of the Body of Evidence

We graded the strength of the body of evidence as per the AHRQ Methods Guide (10,11). For each strength of evidence (SoE) assessment, we considered the number of studies, study designs, study limitations, directness of the evidence, consistency of study results, precision of any estimates of effect, likelihood of reporting bias, and other limitations.

Results

Study Selection

Our searches identified 25,974 unique records, of which we screened 1560 articles in full (Figure 1). We most frequently excluded full-text articles because they lacked a population of interest (877 articles) or described qualitative studies (168 articles). We included 92 studies

(88 cross-sectional studies and 4 cohort studies) published across 91 articles (17,18).

Risk of Bias

Of the 88 cross-sectional studies, we rated 10 studies at high risk of bias, 66 moderate risk, and 12 low risk (Table 2). Concerns mostly related to the nonrandom selection of participants and potential nonresponse bias. Of the four cohort studies, we rated three studies at high risk of bias and one moderate risk (Table 3). Concerns mostly related to incomplete follow-up and inadequate strategies to address the incomplete follow-up.

Burnout

Fifty-four studies (39 studies during routine practice and 15 after a critical incident [COVID-19 pandemic]) reported on the prevalence or severity of burnout (17,18,23,25,27,30–36,39,40,43–46,48,51,52,54–56,59–64,66–68,71,75–78,80,81,85,87,88,91,92,95,96,99–102,105–107). The most frequently used instruments were a version of the Maslach Burnout Inventory (MBI), the Copenhagen Burnout Inventory (CBI), the Professional Quality of Life (ProQOL), Burnout Assessment Tool-12, and the Oldenburg Burnout Inventory. Six studies reported data only for subgroups of EMS clinicians (18,33,34,52,59,67).

For the following sections on burnout during routine practice and after critical incidents, we include further subsections by instrument (MBI first and then other instruments together).

Burnout (measured using the MBI) during routine practice

Six studies (17,25,27,31,46,102) reported on the prevalence of high depersonalization, which ranged from 13.3% in Spain (31) to 99.3% in the United States (46) (Figure 2). Six studies (17,25,31,46,55,102) reported on the prevalence of high emotional exhaustion, which

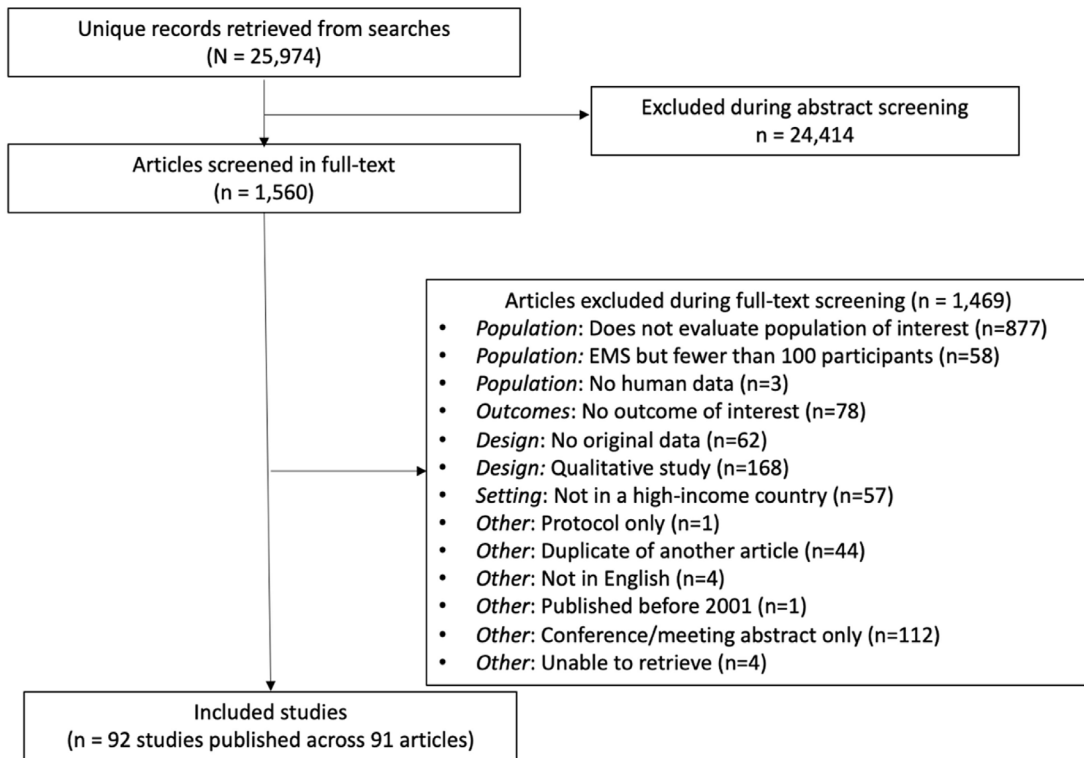


Figure 1. Preferred Items for Reporting in Systematic Reviews and Meta-Analyses flow diagram (12). EMS = Emergency Medical Services.

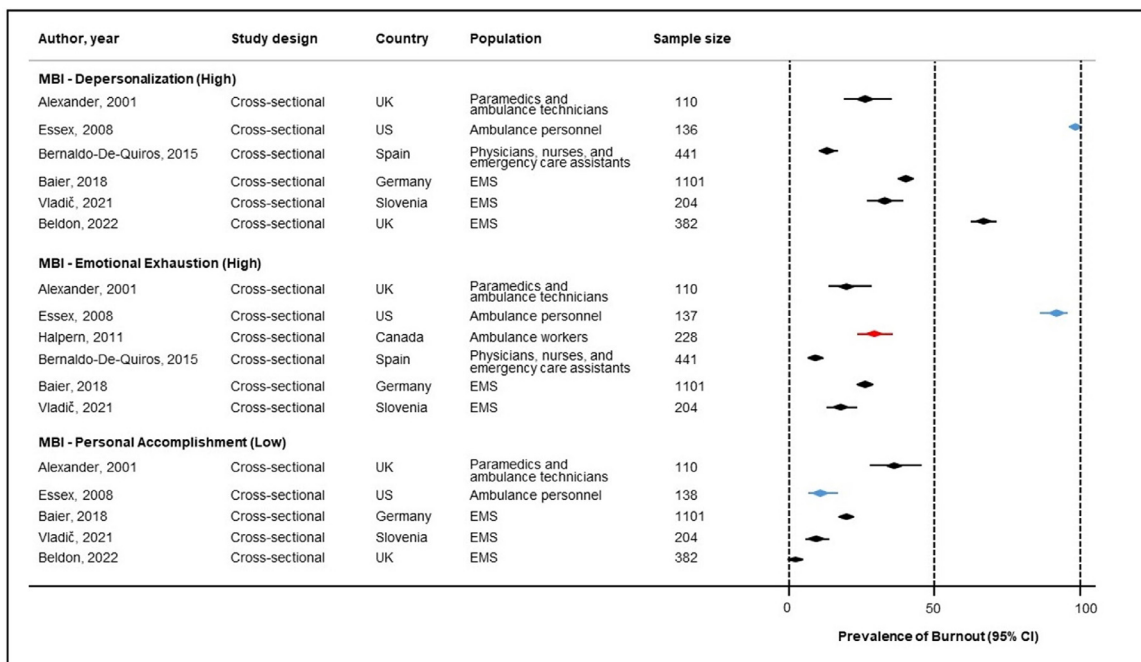


Figure 2. Prevalence of burnout (based on the Maslach Burnout Inventory [MBI]) during routine practice. Blue indicates studies in the United States; red indicates studies in Canada; black indicates studies in countries other than the United States or Canada. EMS = Emergency Medical Services.

Table 2. Risk of Bias in Cross-Sectional Studies.

First Author	Year	Is the Study's Target Population a Close Representation of the National Population?	Is the Sampling Frame a True or Close Representation of the Target Population?	Was Random Selection Used to Select the Sample or Was a Census Undertaken?	Was the Likelihood of Nonresponse Bias Minimal?	Were Data Collected Directly From the Participants?	Was an Acceptable Case Definition Used in The Study?	Was the Instrument That Measured the Parameter of Interest Found to Have Reliability and Validity (if Necessary)?	Was the Same Mode of Data Collection Used for All Participants?	Was the Length of Shortest Prevalence Period for the Parameter of Interest Appropriate?	Were Numerators and Denominators for the Parameter of Interest Appropriate?	Overall Risk of Bias
Alexander (17)	2001	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Alghamdi (19)	2023	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Almutairi (20)	2020	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Alqahtani (21)	2021	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Alshamrani (22)	2024	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Amro (23)	2022	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Moderate
Arial (24)	2011	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Baier (25)	2018	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Bayani (26)	2021	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Moderate
Beldon (27)	2022	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	High
Bennett (28)	2004	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Bentley (29)	2013	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Moderate
Berger (30)	2023	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	High
Bernaldo-De-Quirós (31)	2015	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low

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Table 2. (continued)

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Blanchard (32)	2022	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Moderate
Braun (33)	2021	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Campos (34)	2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Chang (35)	2022	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Chavez (36)	2022	No	No	No	No	Yes	No	No	Yes	Yes	Yes	High
Cheng (37)	2022	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Courtney (38)	2013	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Crowe (39)	2018	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Low
Crowe (40)	2020	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Donnelly (41)	2012	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Donnelly (42)	2016	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Edwards (43)	2017	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Edwards (44)	2020	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Ericsson (45)	2021	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Essex (46)	2008	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Ferkai (47)	2024	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Ferraro (48)	2020	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low

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Finlayson-Short (49)	2024	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Fonseca (50)	2021	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Fragoso (51)	2016	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Moderate
Gallagher (52)	2009	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Gärtner (53)	2019	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Moderate
Grochowska (54)	2022	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Halpern (55)	2011	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Haruna (56)	2023	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Holland (57)	2011	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Hutchinson (58)	2021	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Iorga (59)	2015	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	High
Issler (60)	2017	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	High
Ivánkovits (61)	2024	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Izdebski (62)	2023	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low

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Juliá-Sanchis (63)	2019	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Kang (64)	2022	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Khan (65)	2020a	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Khan (65)	2020b	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Kim (66)	2022	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Moderate
Kim (67)	2023	No	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Moderate
Kling (68)	2020	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Moderate
Kshtriya (69)	2020	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Kyron (70)	2022	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Leszczyński (71)	2019	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	High

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Mackinnon (72)	2020	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Martínez-Caballero (73)	2021	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Moderate
Martínez-Caballero (74)	2023	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Mausz (75)	2022	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
McCann-Pineo (76)	2024	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	High
McGuinness (77)	2022	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Melnik (78)	2023	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Möckel (79)	2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Mroczek (80)	2018	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate

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Navarro Moya (81)	2017	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	High
Newland (82)	2015	No	No	No	No	Yes	Yes	No	Yes	Yes	No	Moderate
Olschowka (83)	2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Petrie (84)	2018	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Popa (85)	2010	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Pyper (86)	2016	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Moderate
Raposa (87)	2023	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Renkiewicz (88)	2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Moderate
Reti (89)	2022	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	High
Sanz-Vergel (90)	2011	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Schwartz (91)	2024	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate

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Setti (92)	2018	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Shakes-peare-Finch (93)	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Soto-Cámara (94)	2022	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Sporer (95)	2017	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Spychala (96)	2023	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	High
Srikanth (97)	2022	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Moderate
Stallman (98)	2023	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Moderate
Tham (99)	2023	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Thyer (100)	2018	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Vettor (101)	2002	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Vladić (102)	2021	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Wastell (103)	2002	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
Wild (18)	2016	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Low

Table 3. Risk of Bias in Cohort Studies.

First Author	Year	Was Exposure Measured in a Valid and Reliable Way?	Were Groups/ Participants Free of the Outcome at the Start of the Study (or at the Moment of Exposure)?	Were Outcomes Measured in a Valid and Reliable Way?	Was Follow-Up Time Reported and Sufficient to Be Long Enough for Outcomes to Occur?	Was Follow-Up Complete, and if Not, Were the Reasons to Loss to Follow-up Described and Explored?	Were Strategies to Address Incomplete Follow-Up Used?	Was Appropriate Statistical Analysis Used?	Overall Risk of Bias
Barrett (104)	2024	Yes	No	Yes	Yes	No	No	No	High
Lee (105)	2022	Yes	No	Yes	Yes	No	Unclear	Yes	Moderate
Sterud (106)	2008	Yes	Yes	Yes	Yes	No	No	No	High
van der Ploeg (107)	2003	Yes	Yes	Yes	Yes	Unclear	No	Yes	High

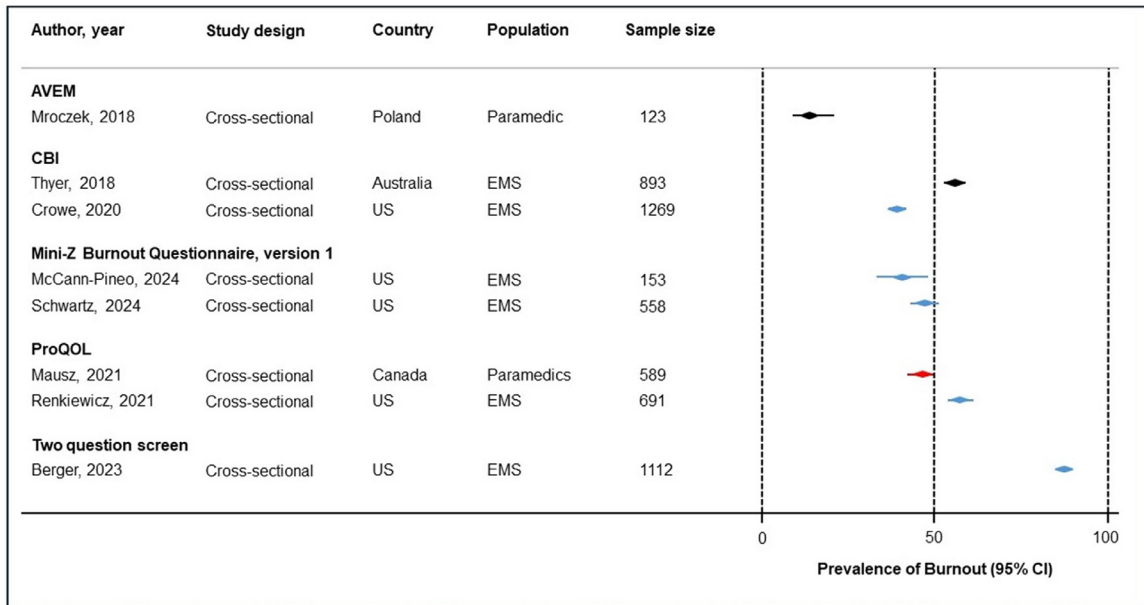


Figure 3. Prevalence of burnout (based on instruments other than the Maslach Burnout Inventory [MBI]) during routine practice. Blue indicates studies in the United States; red indicates studies in Canada; black indicates studies in countries other than the United States or Canada. AVEM = Arbeitsbezogenes Verhaltens und Erlebensmuster questionnaire (work-related behavior and experience patterns); CBI = Copenhagen Burnout Inventory; EMS = Emergency Medical Services; ProQOL = Professional Quality of Life.

ranged from 9.2% in Spain (31) to 92% in the United States (46). Five studies (17,25,27,46,102) reported on the prevalence of low personal accomplishment, which ranged from 1% in the United Kingdom (27) to 36.4% in the United Kingdom (17).

Twelve studies reported burnout severity data for depersonalization (4 studies (17,46,85,107)), emotional exhaustion (9 studies (17,44,46,55,63,81,85,106,107)), and personal accomplishment (5 studies (17,25,27,46,102)). The studies frequently used their own versions of the MBI, such as the MBI-General Scale, which precluded synthesis of continuous data (92).

Burnout (measured using instruments other than the MBI) during routine practice

Fifteen studies (30,40,45,48,51,61,68,71,75,76,80,88,91,100,101) evaluate burnout using instruments other than the MBI.

Ten studies (30,40,48,71,75,76,80,88,91,100) reported on the prevalence of burnout. Of these, eight studies (30,40,75,76,80,88,91,100) reported on the prevalence of any burnout, which ranged from 13.9% in Poland (80) to 87.7% in the United States (30) (Figure 3). Of these studies, Crowe et al., who reported a 39.1% prevalence of any burnout in the United States, also reported the prevalence of patient-related burnout, work-related burnout, and agency-related burnout as 11.6%, 37.6%, and 35.0%, respectively (40). Leszczyński et al. reported a 15.7%

prevalence of high-risk burnout in Poland (71). Ferraro et al. reported a 29.8% prevalence of intermediate burnout and 1.7% prevalence of severe burnout in Italy (48).

Seven studies (45,51,61,68,75,88,101) reported continuous data on burnout (Figure 4). Three studies reported mean ProQOL scores (10–50; higher score indicates worse quality of life) that ranged from 22.79 in Canada (75) to 23.68 in the United States (68). Frago et al. reported a mean \pm SD Oldenburg Burnout Inventory score (0–4; higher score indicates worse burnout) of 2.65 ± 0.37 and a mean \pm SD CBI (0–100; higher score indicates worse burnout) of 3.10 ± 0.83 in the United States (51). Vettor et al. used the Staff Burnout Scale for Health Professionals (20–140; higher score indicates worse burnout) and reported a mean \pm SD score of 56.72 ± 20.79 in the United States and Canada (101). Ericsson et al. used the Burnout subscale of the Short ProQOL (3–18; higher score indicates worse burnout) and reported a mean \pm SD of 6.0 ± 2.3 in Finland (45). Ivánkovits et al. used the Burnout Measure (1–7, higher score indicates worse burnout) and reported a mean \pm SD score of 2.70 ± 4.90 in Hungary (61).

Burnout (measured using the MBI) after critical incidents

Two studies (1 in Spain (31) and 1 in Australia (46)) during the COVID-19 pandemic reported on the following

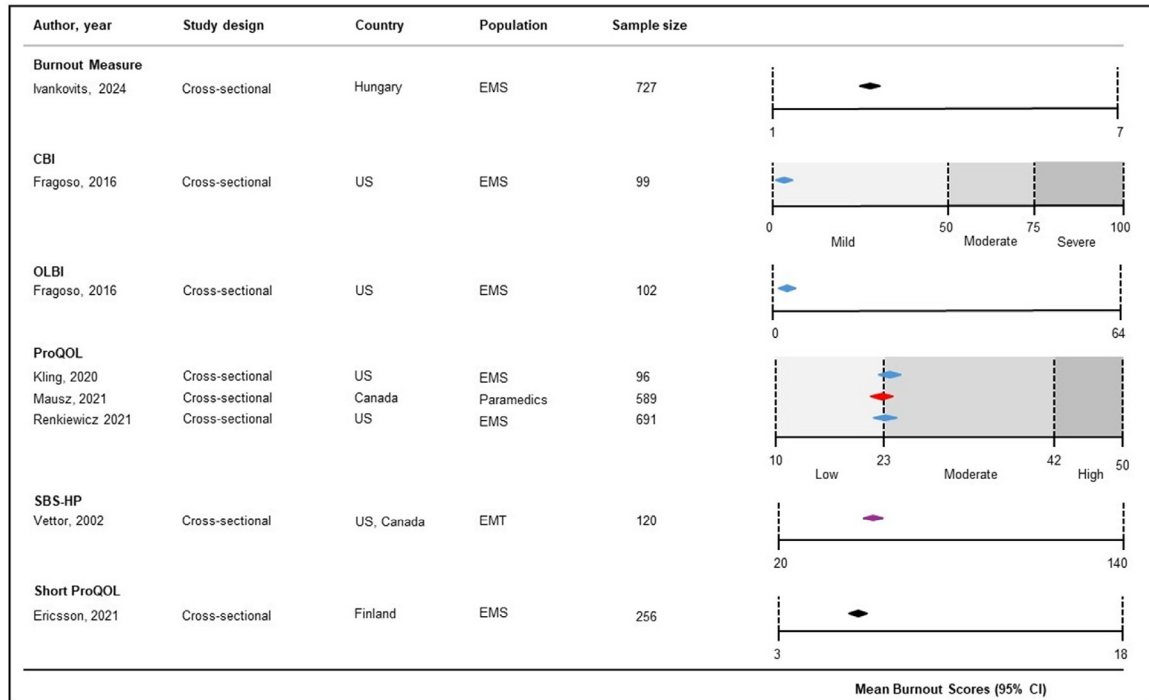


Figure 4. Severity of burnout (based on instruments other than the Maslach Burnout Inventory [MBI]) during routine practice. Blue indicates studies in the United States; red indicates studies in Canada; purple indicates studies in the United States and Canada; black indicates studies in countries other than the United States or Canada; shades of gray indicate severity of burnout as indicated below each x-axis. AVEM = Arbeitsbezogenes Verhaltens und Erlebensmuster questionnaire (work-related behavior and experience patterns); CBI = Copenhagen Burnout Inventory; EMS = Emergency Medical Services; EMT = emergency medical technicians; OLBI = Oldenburg Burnout Inventory; ProQOL = Professional Quality of Life; SBS-HP = Staff Burnout Scale for Health Professionals.

prevalence of burnout: high depersonalization (32% and 60.7%, respectively), high emotional exhaustion (35% and 68%, respectively), and low personal accomplishment (48% and 61.2%, respectively).

Five studies reported continuous data on burnout for the MBI subscales addressing depersonalization (5 studies (23,54,77,87,105)), emotional exhaustion (4 studies (23,54,77,105)), and personal accomplishment (5 studies (23,54,77,87,105)). The studies frequently used their own versions of the MBI, which precluded synthesis of continuous data.

Burnout (measured using instruments other than the MBI) after critical incidents

Ten studies (23,32,35,36,54,56,62,66,96) used instruments other than the MBI to evaluate burnout.

Six studies (32,54,56,62,66,96) reported on the prevalence of burnout using inconsistent definitions. Three studies reported the prevalence of any burnout as 42.5% in the United States (32) and 18.3% (96) and 38.3% (54) in Poland. Kim et al. reported 73.9% and 83.7% prevalence for exhaustion-related and disengagement-related burnout, respectively, in South Korea (66). Haruna et al. reported a 25.56% prevalence of emotional exhaustion or

depersonalization in Japan (56). Izdebski et al. reported that 15.0% and 14.4% of clinicians were at risk and at considerable risk of burnout, respectively, in Poland (62).

Eight studies (23,35,36,54,62,77,78,105) reported on the severity of burnout using inconsistent definitions. The studies frequently used their own versions of the tools, which precluded synthesis of continuous data.

Stress

Fifty studies (published across 49 articles) reported on the prevalence or severity of stress, peritraumatic stress, or posttraumatic distress (17,19–24,28,29,32,37,38,41,42,45,47,49,50,53,57,58,65,66,68–70,72–76,78,79,82–84,86,89–91,93–99,103,104). We have organized the stress outcomes by the categories defined in Table 4.

General Stress

Twenty-one (20,23,29,37,38,47,50,58,65,74,75,78,79, 83,86,94–97,103) cross-sectional studies reported on general stress (13 during routine practice and 8 after a critical incident [i.e., COVID-19 pandemic]).

Table 4. Definition of Stress, Peritraumatic Stress, And Posttraumatic Stress Outcome Categories.

Outcome Category	Definition of Outcome Category	Specific Outcomes Reported in Included Studies
Stress	Stress is defined as the nonspecific response of the body to any demand placed upon it (108–110).	General stress, job stress, and psychological distress
Peritraumatic stress	Peritraumatic stress is defined as the emotional and physiological distress experienced during or immediately after a traumatic event and is associated with the development and severity of PTSD and related psychological difficulties (111).	Peritraumatic distress and secondary traumatic stress
Posttraumatic distress	Posttraumatic distress is an umbrella term for 1) subsyndromal posttraumatic stress, 2) acute stress disorder, 3) PTSD, 4) vicarious traumatic stress, 5) compassion fatigue, and 6) secondary traumatic stress (112).	Acute stress disorder

PTSD = posttraumatic stress disorder.

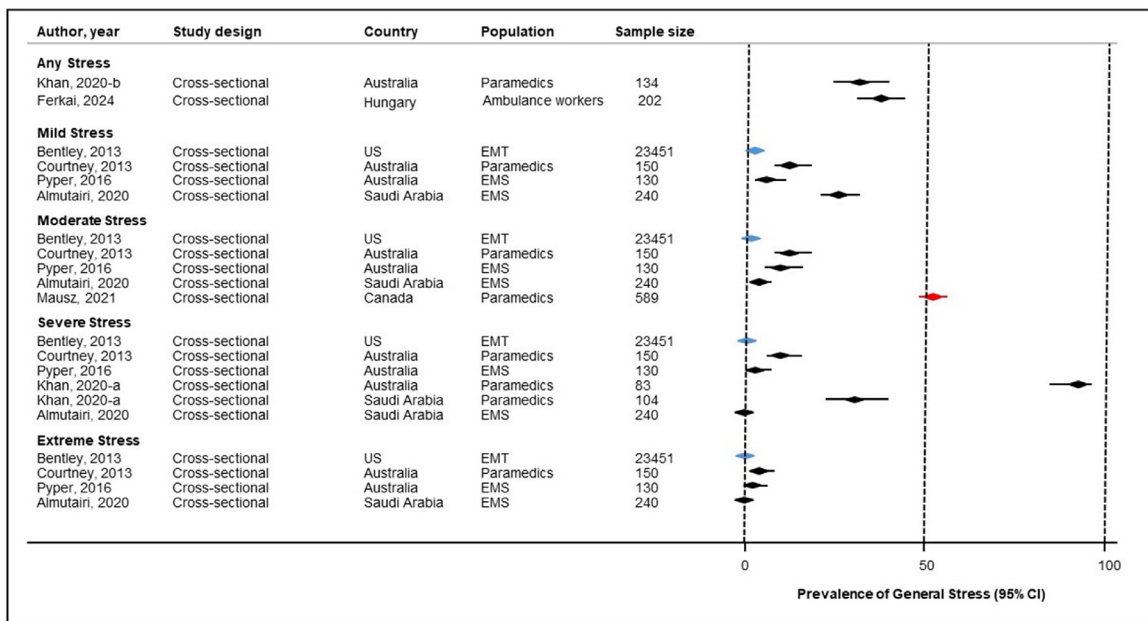


Figure 5. Prevalence of general stress during routine practice. Blue indicates studies in the United States; red indicates studies in Canada; black indicates studies in other countries. EMS = Emergency Medical Services; EMT = emergency medical technician.

General stress during routine practice

Thirteen studies (20,29,38,47,50,58,65,75,83,86,95,103), published between 2002 and 2024 reported on general stress during routine practice. Eight studies (20,29,38,47,65,75,86) reported on the prevalence of general stress (Figure 5).

- Any general stress: Two studies used the Perceived Stress Scale (PSS) and reported the prevalence as 32.0% in Australia (65) and 37.5% in Hungary (47).

- Mild general stress: Four studies (20,29,38,86) used the Depression, Anxiety, and Stress Scale (DASS-21) and reported prevalence that ranged from 3.1% in the United States (29) to 26.3% in Saudi Arabia (20).
- Moderate general stress: Five studies (20,29,38,75,86) used the DASS-21 and reported prevalence that ranged from 1.9% in the United States (29) to 52.7% in Canada (75).
- Severe general stress: One study (20,29,38,86) used the PSS-14 and reported the prevalence as 93% in

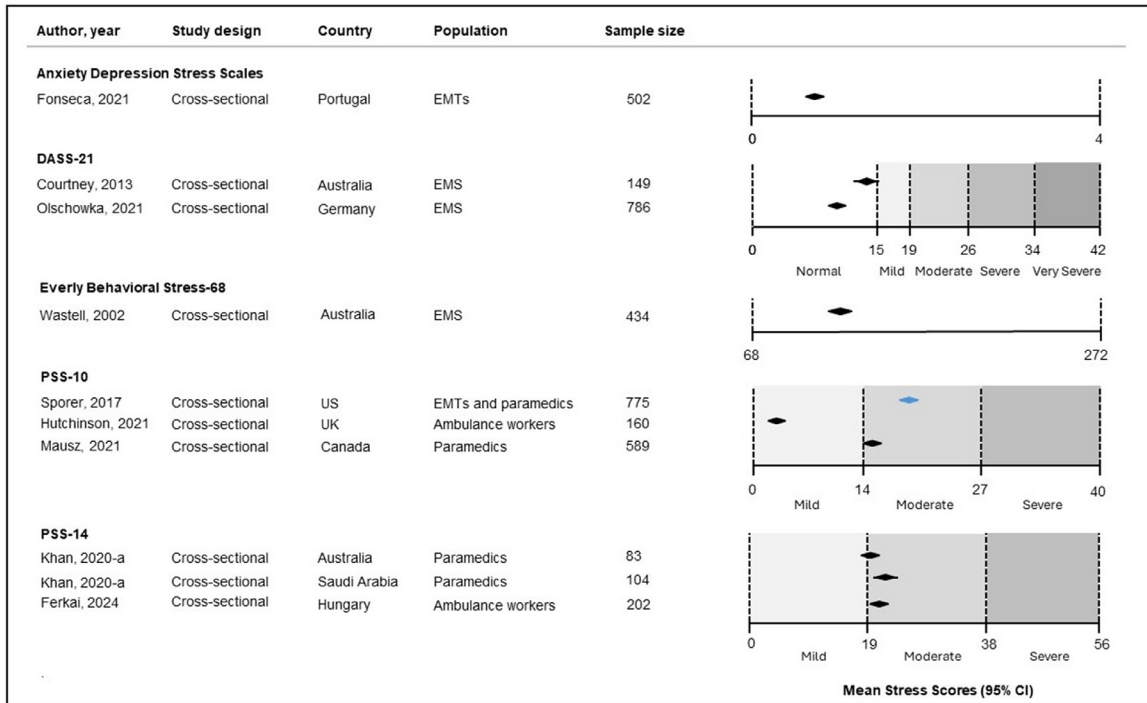


Figure 6. Severity of general stress during routine practice. Blue indicates studies in the United States; red indicates studies in Canada; black indicates studies in other countries; shades of gray indicate severity of stress, where thresholds were available. DASS-21 = 21-item Depression Anxiety and Stress Scale; EMS = Emergency Medical Services; EMT = emergency medical technician; PSS-10 = 10-item Perceived Stress Scale; PSS-14 = 14-item Perceived Stress Scale.

Australia and 31% in Saudi Arabia (65). Four studies used the DASS-21 and reported prevalence that ranged from 0% in Saudi Arabia (20) to 14.1% in Australia (38).

- Extremely severe general stress: Four studies (20,29,38,86) used the DASS-21 and reported that the prevalence ranged from 0% in Saudi Arabia (20) to 4.0% in Australia (38).

Nine studies (38,47,50,58,65,75,83,95,103) reported on the severity of general stress using four instruments: PSS-10 (5 studies), PSS-14 (2 studies), DASS-21 (2 studies), Anxiety Depression Scale (1 study), and Everly Behavioral Stress-68 (1 study) (Figure 6). Three of the studies (58,75,95) using the PSS-10 (0–40; higher score indicates worse stress) provided mean scores, of which one study in the United Kingdom reported a scale mean \pm SD of 2.86 ± 0.71 (58) and the other two studies reported mean \pm SD summed scores ranging from 14.93 ± 6.26 in Canada (75) to 19.05 ± 7.75 in the United States (95). Two studies used the PSS-14 (0–56; higher score indicates worse stress), of which one study reported that paramedics in Australia and Saudi Arabia had a mean \pm SD of 19.5 ± 4.1 and 21.9 ± 10.3 , respectively (65), and the other study in Hungary reported a mean \pm SD of 21 ± 8.52 (47). Of the two studies using the DASS-21 (0–42; higher score indicates worse stress), the mean \pm SD were

10.25 ± 7.8 in Germany (83) and 13.63 ± 9.6 in Australia (38). One study used the Anxiety Depression Scale (0–4; higher score indicates worse anxiety and depression) and reported a mean \pm SD of 0.73 ± 0.53 in Portugal (50). One study used the Everly Behavioral Stress-68 (68–272; higher score indicates worse stress) and reported a mean \pm SD of 119.5 ± 31.5 in Australia (103).

General stress after critical incidents

Six studies reported on the prevalence of general stress after critical incidents (all during the COVID-19 pandemic) (Figure 7) (23,37,74,94,96,97).

- Any general stress: One study reported a 30.8% prevalence in Taiwan (37).
- Severe general stress: Four studies (23,74,96,97) reported prevalence that ranged from 14% in Spain (23) to 67.5% in the United States (97).
- Severe or extreme general stress: One study reported a 37.4% prevalence of in Spain (94).
- Extreme general stress: Two studies reported prevalence of 11.0% in Poland (96) and 14.8% in Spain (74).

Three studies reported on the severity of general stress after critical incidents (74,78,79). These included a study in the United States that used the CBI and reported a mean

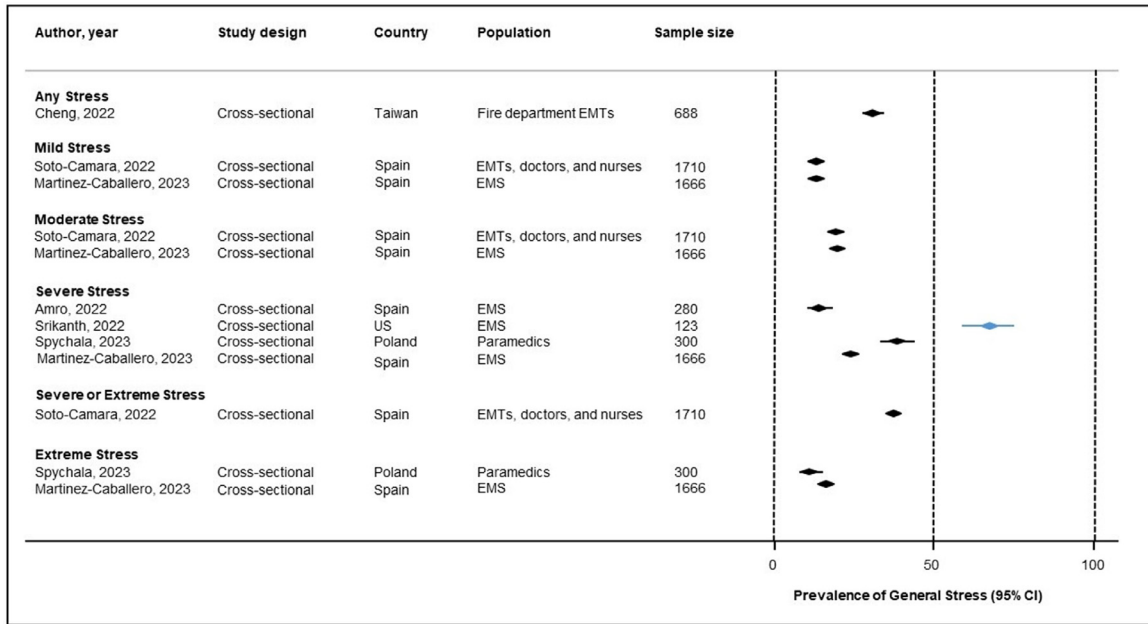


Figure 7. Prevalence of general stress after critical incidents. Blue indicates studies in the United States; black indicates studies in countries other than the United States or Canada. EMS = Emergency Medical Services; EMT = emergency medical technician.

± SD general stress score of 50 ± 23 (78), a study in Germany that used the DASS-21 and reported a mean ± SD general stress score of 9.11 ± 0.36 (79), and a study in Spain that used the DASS-21 and reported a mean ± SD score of 20.5 ± 11 (74).

Job Stress

Job stress during routine practice

Four cross-sectional studies (2 in the United States, 1 in Canada, and 1 in the United Kingdom), published between 2005 and 2022, reported on critical incident job stress during routine practice (28,41,42,82). Each study used a different instrument with variable numbers, frequencies, or types of critical incident exposures. One study reported a prevalence of critical incident stress, which was 85.7% in the United States (82).

Job stress after critical incidents

Five studies, published between 2021 and 2024, reported on job stress within the context of COVID-19 pandemic (21,32,49,66,99). No study reported on the prevalence of job stress after critical incidents. Each study used a different instrument to measure job stress. Four studies (21,32,66,99) reported mean job stress scores. Blanchard et al. used the Job Stress Scale and reported a mean ± SD of 3.5 ± 0.8 in the United States (32). Kim et al. used the Global Assessment of Recent Stress (0–72; higher score indicates worse stress) and reported a mean ± SD of 17.8 ± 10.8 in South Korea (66). Tham et al. used the

COVID-adapted version of the Perceived Severe Acute Respiratory Syndrome Stress Scale (1–4; higher score indicates worse stress) and reported a mean ± SD of 2.75 ± 0.63 in Australia (99). Alqahtani et al. used a World Health Organization questionnaire on psychological and social well-being of health care workers that had been used during the H1N1 influenza outbreak (0–10; higher score indicates worse psychological and social well-being) and reported a mean ± SD of 7.13 ± 2.19 in Saudi Arabia (21). Finlayson-Short et al. used their own 21-item instrument (49). Although an overall mean job stress score was not reported, means (1–9; higher score indicates worse stress) for each operational and occupational stressor were reported separately. Mean ± SD scores ranged from 3.79 ± 2.39 to 6.60 ± 2.43 for operational stressors and from 3.55 ± 2.81 to 5.93 ± 2.61 for organizational stressors (49).

Psychological Distress

Twelve cross-sectional studies (9 studies (17,22,24,57,70,72,84,93,98) during routine practice and 3 studies (19,73,104) after a critical incident [i.e., COVID-19 pandemic]), published between 2001 and 2024, reported on psychological distress.

Psychological distress during routine practice

Across the eight studies (17,22,24,57,70,72,84,93) that reported the prevalence of high psychological distress, the range was from 7.6% in Australia (84) to 69.4% in Saudi

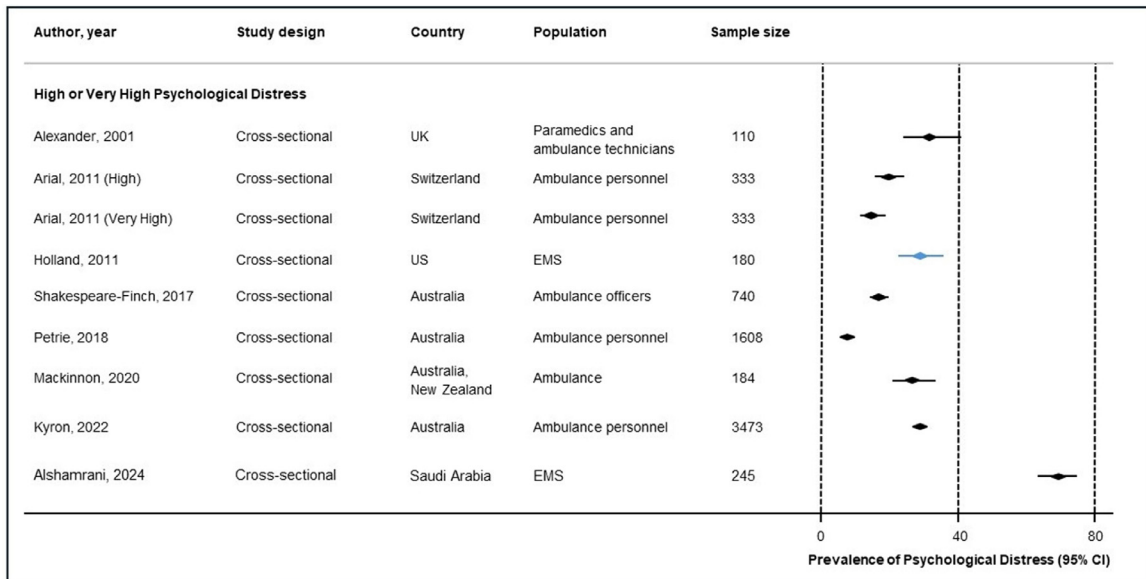


Figure 8. Prevalence of psychological distress during routine practice. Blue indicates studies in the United States; black indicates studies in countries other than the United States or Canada. EMS = Emergency Medical Services.

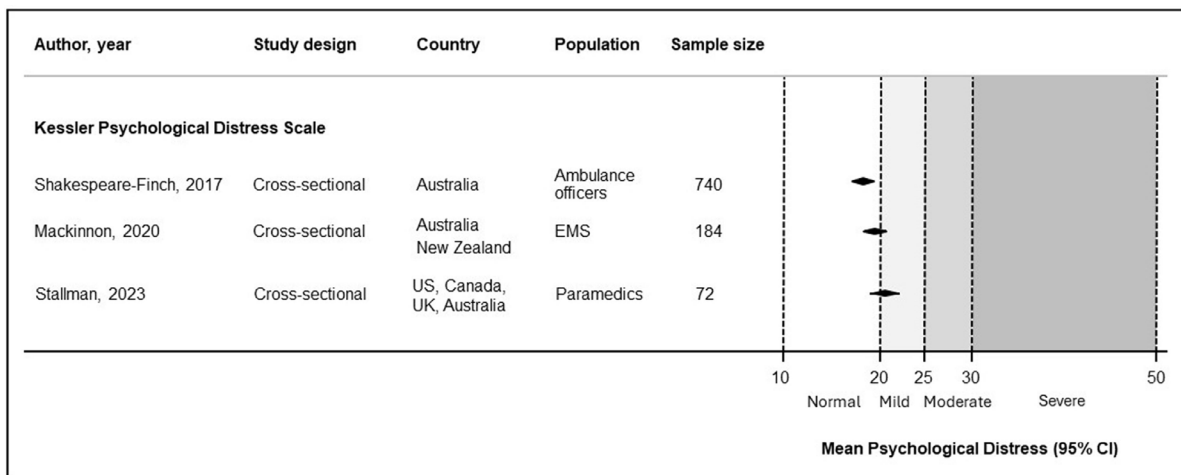


Figure 9. Severity of psychological distress during routine practice. Black indicates studies in countries other than the United States or Canada; shades of gray indicate severity of psychological distress. EMS = Emergency Medical Services.

Arabia (22) (Figure 8). Four studies used the 10-item version of the Kessler Psychological Distress Scale (10–50; higher score indicates worse distress), three studies used the General Health Questionnaire (0–84; higher score indicates worse general health), and one used the Impact Event Scale.

Three studies (72,93,98) (conducted across a total of five countries, i.e., United States, Canada, United Kingdom, Australia, and New Zealand) used the Kessler Psychological Distress Scale and reported mean ± SD psychological distress scores ranging from 18.55 ± 6.73 in Australia (93) to 20.82 ± 6.62 in a study conducted in the United States, Canada, the United Kingdom, and Australia (98) (Figure 9).

Psychological distress after critical incidents

Three studies reported on the prevalence of psychological distress after critical incidents (i.e., COVID-19 pandemic) (19,73,104). The prevalence of any psychological distress was 84% in a cohort study in the United Kingdom, but within 6 months the prevalence dropped to 67% (104). The prevalence of high psychological distress was 36.0% in Spain (73) and 73.1% in Saudi Arabia (19).

Secondary Traumatic Stress

Three studies, published between 2020 and 2022, used either the full or modified versions of the ProQOL to measure secondary traumatic stress during routine practice

(45,68,75). Kling et al. (68) and Mausz et al. (75) used the full version (10–50; higher score indicates worse quality of life) and reported mean \pm SD scores of 21.94 ± 6.11 in the United States (68) and 17.80 ± 5.74 in Canada, respectively. Ericsson et al. used a modified version (3–18; higher score indicates worse quality of life) and reported an overall mean \pm SD of 4.9 ± 2.0 in Finland (45). No study reported on the prevalence of secondary traumatic stress.

Moral Injury

Bayani used the Moral Injury Events Scale (MIES) and reported mean moral injury scores among 184 EMS clinicians during routine practice (26). For perceived transgressions by self (Self Subscale of the MIES; 2–12; higher score indicates worse moral injury), the mean \pm SD was 5.9 ± 3.3 . For perceived transgressions by others (Other Subscale of the MIES; 4–24; higher score indicates worse moral injury), the mean \pm SD was 15.1 ± 5.2 .

Modifying factors for burnout, stress, and moral injury are detailed in [Appendix B](#).

Discussion

Summary of Findings

This systematic review identified 92 studies addressing burnout, stress, or moral injury among EMS clinicians. The evidence profiles with conclusions during routine practice and after critical incidents are provided in [Tables 5 and 6](#), respectively. Regarding burnout, during routine practice, there was considerable variation in the prevalence of any burnout (13.9–87.7%), high depersonalization (13.3–99.3%), high emotional exhaustion (9.2–92%), and low personal achievement (1–36.4%) (low SoE). Similarly, after critical incidents, there was considerable variation in the prevalence of any burnout (18.3–38.3%), high depersonalization (32–60.7%), high emotional exhaustion (35–68%), and low personal achievement (48–61.2%) (low SoE). The mean levels of burnout were of mild to severe severity during routine practice (moderate SoE), but evidence regarding the severity of burnout after critical incidents was insufficient.

Regarding stress, during routine practice, there was considerable variation in the prevalence of any (32.0–37.5%), mild (3.1–26.3%), moderate (1.9–52.7%), severe (0–93%), and extremely severe (0–4.0%) general stress (low SoE). Similarly, after critical incidents, there was considerable variation in the prevalence of severe general stress (11.0–67.5%) and high psychological distress (36.0–73.1%) (low SoE). During routine practice, the mean levels of general stress as well as operational and

organizational job stress were of mild to severe severity, the mean levels of psychological distress were of moderate severity, and the mean levels of secondary traumatic stress were mild (moderate SoE for each). Evidence regarding the severity of stress after critical incidents was insufficient.

Regarding moral injury, during routine practice, the mean levels tend to be of moderate severity (low SoE).

Implications for Clinical Practice

Mental health is a state of mental well-being in which people cope well when confronted by stressors and trauma, realize their own potential, function productively even when faced with adversity, and contribute to their communities (113). Emergency responders, such as EMS clinicians, are at elevated risk for psychological injury. Given the foundational role that EMS clinicians play in a society's health, what threatens their well-being threatens the core fabric of society.

This systematic review focused on the following three pervasive constructs: burnout, stress, and moral injury. Burnout among health care workers has been found to be associated with poor job satisfaction and intention to leave the job (39,114). Such turnover is likely not only costly but may adversely affect patient care. Our review revealed the prevalence of burnout among EMS clinicians to considerably vary both during routine practice (13.9–87.7%) and after critical incidents (18.3–38.3%). The highest reported prevalence approximates twice the prevalence of burnout among workers in the general population (44%) (115). Deconstructing burnout into its component parts, our review found burnout likely manifesting itself as a generalized exhaustion among EMS clinicians and a compensatory lack of empathy manifesting in depersonalized emotional detachment, cynicism, and callousness in interactions with others. These manifestations are arguably capable of undermining commitment to the profession and patient care itself (116).

In the current systematic review, we examined stress separately from burnout. Although the two constructs are related, results of factor analyses have shown construct distinctiveness and revealed that combining the two constructs can lead to reduced sensitivity (117). Stressful working conditions have been found to be associated with increased absenteeism, tardiness, and intentions by workers to quit their jobs (118,119). Stressful working conditions have also been found to be associated with anxiety and depression among emergency clinicians (120). In the current review, we found considerable variation in the prevalence of any to severe stress among EMS clinicians during routine practice (32–93%). This is at least three times the prevalence in the general population (12–18%) (121).

Table 5. Evidence Profile for Incidence, Prevalence, and Severity of Burnout, Stress, and Moral Injury During Routine Practice.

Outcome	Measure	No. of Studies (No. of Participants)	Risk of Bias	Consistency	Precision	Directness	Reporting Bias	Strength of Evidence	Conclusions
Burnout	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	15 (8741)	Moderate	Inconsistent	Precise	Direct	Undetected	Low	Considerable variation in prevalence of any burnout (13.9–87.7%), high depersonalization (13.3–99.3%), high emotional exhaustion (9.2–92%), and low personal achievement (1–36.4%).
	Severity	19 (10,977)	Moderate	Consistent	Precise	Direct	Undetected	Moderate	Mild to severe burnout
Stress	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	9 (25,234)	Moderate	Inconsistent	Precise	Direct	Undetected	Low	Considerable variation in prevalence of any (32.0–37.5%), mild (3.1–26.3%), moderate (1.9–52.7%), severe (0–93%), and extremely severe (0–4.0%) general stress (9 studies).

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Table 5. (continued)

Outcome	Measure	No. of Studies (No. of Participants)	Risk of Bias	Consistency	Precision	Directness	Reporting Bias	Strength of Evidence	Conclusions
	Severity	17 (9483)	Moderate	Consistent	Precise	Direct	Undetected	Moderate	Mild to moderate general stress (9 studies) and operational and organizational job stress (9 studies). Moderate psychological distress (3 studies).
Peritraumatic stress	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	0 (0)	—	—	—	—	—	—	None
	Severity	3 (999)	Moderate	Consistent	Precise	Direct	Undetected	Moderate	Mild secondary traumatic stress
Posttraumatic distress	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	0 (0)	—	—	—	—	—	—	None
	Severity	1 (146)	High	Unknown	Precise	Direct	Undetected	Insufficient	None
Moral injury	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	0 (0)	—	—	—	—	—	—	None
	Severity	1 (184)	Moderate	Unknown	Precise	Direct	Undetected	Low	Moderate

Table 6. Evidence Profile for Incidence, Prevalence, and Severity of Burnout, Stress, and Moral Injury After Critical Incidents.

Outcome	Measure	No. of Studies (No. of Participants)	Risk of Bias	Consistency	Precision	Directness	Reporting Bias	Strength of Evidence	Conclusions
Burnout	Incidence	0 (0)	—	—	—	—	—	—	None Considerable variation in prevalence of any burnout (18.3–38.3%), high depersonalization (32–60.7%), high emotional exhaustion (35–68%), and low personal achievement (48–61.2%).
	Prevalence	6 (1580)	Moderate	Inconsistent	Precise	Direct	Undetected	Low	
Stress	Severity	11 (13,712)	Moderate	Unknown	Precise	Direct	Undetected	Insufficient	None
	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	8 (3845)	Moderate	Inconsistent	Precise	Direct	Undetected	Low	Considerable variation in prevalence of severe general stress (11.0–67.5%) and of high psychological distress (36.0–73.1%).
	Severity	4 (1770)	Moderate	Inconsistent	Precise	Direct	Undetected	Insufficient	None

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Table 6. (continued)

Outcome	Measure	No. of Studies (No. of Participants)	Risk of Bias	Consistency	Precision	Directness	Reporting Bias	Strength of Evidence	Conclusions
Peritramatic stress	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	0 (0)	—	—	—	—	—	—	None
	Severity	0 (0)	—	—	—	—	—	—	None
Posttraumatic distress	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	0 (0)	—	—	—	—	—	—	None
	Severity	0 (0)	—	—	—	—	—	—	None
Moral injury	Incidence	0 (0)	—	—	—	—	—	—	None
	Prevalence	0 (0)	—	—	—	—	—	—	None
	Severity	0 (0)	—	—	—	—	—	—	None

Systematic reviews (122,123), qualitative interviews (124), and quantitative surveys (125) have found that moral injury is associated with posttraumatic stress disorder, depression, demoralization, hopelessness, operational ineffectiveness, and even suicidal ideation among health care professionals. It seems reasonable that such manifestations might adversely affect EMS clinicians' dedication to the profession and could adversely affect patient care. However, we are not aware of data on moral injury among civilians without combat exposure and are thus unable to make meaningful comparisons.

In terms of modifying factors (Appendix B), we identified several factors as contributors to burnout, including social isolation, workplace incivility, and exposure to physical and verbal violence. However, the impacts of demographic variables such as age, sex, and education on burnout seemed inconsistent across studies. Notably, and as might be expected, the COVID-19 pandemic exacerbated burnout levels, particularly evident in higher rates of depersonalization and emotional exhaustion during this period. Stress, peritraumatic stress, and posttraumatic distress constitute multifaceted challenges among EMS clinicians, exerting impacts on mental health and well-being. Although the identified evidence offers valuable insights into the prevalence and severity of stress-related outcomes among EMS clinicians, considerable gaps remain in understanding their dynamic interplay with individual, organizational, and environmental factors. Various modifying factors influenced stress experiences as burnout, work conditions, and experience were associated with stress and distress. Female sex, not belonging to a minority group (e.g., racial minority group), having a college degree, being a paramedic, having more trauma exposure, having more overtime work, and higher call volumes may be associated with more general stress. Male sex, being a paramedic, and having more years of experience may be associated with more job stress. Being a paramedic and having more trauma exposure may be associated with more psychological distress, and having peer support may be associated with less psychological distress.

Strengths and Shortcomings of the Evidence Base

The main strength of the evidence base is its applicability to the United States decision-making context. The evidence summarized provides insights into the prevalence and severity of burnout and stress for EMS clinicians during routine practice or after critical incidents. However, we were unable to make any high SoE conclusions in the entire systematic review. This inability stemmed from some important limitations to the evidence base, mostly related to the considerable variation

across studies. First, studies reporting prevalence or severity estimates were often conducted in different countries and settings (e.g., urban vs. rural, large vs. small agencies). Second, studies enrolled heterogeneous populations in terms of demographic factors, training, work experience, and sample sizes. Third, studies varied considerably in terms of context (during routine practice vs. after various types of critical incidents). Fourth, studies often measured or categorized the same outcome using diverse measurement instruments in terms of the number and types of question items (e.g., what/how stressed was defined), use of different versions of the same instrument, and study-specific modifications made to the instrument items or subscales or scoring methodologies and thresholds. Finally, perhaps the biggest challenge with reviewing this evidence base and evaluating the validity of reported findings related to issues of construct distinctiveness and the variability of the psychometric assessments of the mental health constructs examined. Burnout, for example, was assessed as a single construct in some instances and a deconstructed concept in others. This calls into question whether studies using different measurement instruments to measure the same purported constructs are comparable. In reporting this systematic review, we detailed the constructs and their respective measurement instruments to allow the reader to assess relevant convergence and therefore generalizability. However, this limitation prevented us from asserting far-reaching generalizable conclusions for the EMS clinician workforce.

Implications for Research

First, the lack of data on incidence of any outcome among EMS clinicians remains an important gap. This highlights a crucial need for future research to evaluate burnout, stress, and moral injury in terms of the extent of their onset (i.e., cumulative incidence) and rapidity of their onset (i.e., incidence rate). Such longitudinal investigations into the trajectories of outcomes among EMS clinicians would be of immense value. Second, when conducting studies of mixed populations of emergency workers, future researchers should stratify results by those who do vs. do not perform clinical EMS work. This will enable a better understanding of the health of the distinct population of EMS clinicians. Third, the included studies did not consistently report information regarding key characteristics of the agencies in which the study was conducted (e.g., size, characteristics, and overtime restrictions). These characteristics may serve as moderator variables or as alternative sources of effect. Fourth, the field would benefit from more prospective or retrospective longitudinal studies that are rigorously designed, conducted, and analyzed.

Limitations

There are some important limitations to this systematic review. First, to adhere to project timelines, we restricted full synthesis of EMS clinician studies to those that enrolled at least 100 participants. Moreover, a sample size restriction enabled us to focus on larger and potentially more rigorous studies. Second, we excluded studies involving populations of firefighters, rescue workers, emergency workers, and first responders unless the study authors specified that most participants did EMS work or the authors reported separate data for EMS clinicians. Our reasoning for this was that EMS clinicians are distinct from firefighters, notably due to their prolonged exposure to patients during transport, the performance of medical procedures, and the considerable medical responsibilities related to patient care. Third, we restricted the evidence to English-language studies published in the year 2001 onward, corresponding to the September 11, 2001, attacks in the United States.

Conclusions

By responding to and managing emergencies and coordinating critical services, EMS clinicians are vital to public health, medical infrastructure, and safety. However, the routinely demanding and traumatic nature of their work exposes them to substantial stress issues, such as burnout, general stress, peritraumatic stress, posttraumatic distress, and moral injury. In this systematic review we comprehensively and critically examined the breadth and depth of available research on the incidence, prevalence, and severity of stress among EMS clinicians. We also identified crucial modifying factors that may influence burnout, stress, and moral injury outcomes. In sum, the risk of disabling burnout, stress, and moral injury should be re-interpreted from being viewed as the inherent “cost of caring” to being viewed as an occupational health and safety risk that demands evidence-based interventions specifically designed or tailored to reduce said risk in this vital population.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have seemed to influence the work reported in this paper.

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– review & editing, Writing – original draft, Methodology, Data curation. **Enid Chung Roemer:** Writing – review & editing, Investigation, Data curation. **Edbert B. Hsu:** Writing – review & editing, Data curation. **Genie Han:** Writing – review & editing, Data curation. **Allen Zhang:** Writing – review & editing, Project administration, Formal analysis, Data curation. **Ritu Sharma:** Writing – review & editing, Resources, Project administration, Data curation. **Emmanuel Asenso Jr:** Writing – review & editing, Data curation. **Drew Bidmead:** Writing – review & editing, Data curation. **Eric B. Bass:** Writing – review & editing, Resources, Methodology, Funding acquisition, Conceptualization. **Ian J. Saldanha:** Writing – review & editing, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

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Protocol Availability

The protocol for the larger systematic review that this systematic review is a part of is available at: <https://effectivehealthcare.ahrq.gov/products/ems-911-workforce-mental-health/protocol>

Data Availability

Data extracted for this systematic review are available at: https://srdplus.ahrq.gov/public_data?id=5014&type=project.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jemermed.2026.02.034](https://doi.org/10.1016/j.jemermed.2026.02.034).

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Article Summary

1. Why is this topic important?

Given the importance of care delivered by Emergency Medical Services (EMS) clinicians, it is important to assess what is known about burnout, stress, and moral injury in this crucial workforce. This is critical for the patients they serve.

2. What does this review attempt to show?

This systematic review attempts to summarize the incidence, prevalence, and severity of adverse mental health conditions, including burnout, stress, and moral injury among EMS clinicians.

3. What are the key findings?

No study reported on the incidence of any of our outcomes of interest. There was considerable heterogeneity in prevalence and severity by country, setting, population, context, and outcome measurement instruments and scoring methodology/threshold.

4. How is patient care impacted?

Although variable, the stress issues in the EMS workforce are substantial enough to merit greater attention by health systems. Addressing the numerous mental health and stress challenges facing EMS clinicians will require evidence-based comprehensive strategies that consider the modifying factors associated with poor outcomes.